

MEMORANDUM | 2 April 2012

TO U.S. Fish and Wildlife Service

FROM Industrial Economics, Incorporated (IEc)

SUBJECT Estimated Economic Impacts Associated with the Final Designation of Critical Habitat for the Spikedace and Loach Minnow

BACKGROUND

The purpose of this memorandum is to provide information on the potential baseline and incremental economic impacts associated with designation of critical habitat for the spikedace (*Meda fulgida*) and loach minnow (*Tiaroga cobitis*), as described in the Final Rule.¹ The February 2012 Final Economic Analysis of Critical Habitat Designation for the Spikedace and Loach Minnow (FEA) describes baseline and incremental economic impacts associated with areas proposed for designation (as described in the October 2010 Proposed Rule).² The October 2010 Rule (as amended in the October 2011 Notice of Availability) proposed designation of 726 miles of streams as critical habitat for spikedace, and 709 miles of streams as critical habitat for loach minnow. The majority of river miles designated for loach minnow overlap the river miles designated for spikedace. These river miles were organized in eight critical habitat units and 42 stream segments across 12 counties in Arizona and New Mexico. The Final Rule excludes approximately 119 river miles under section 4(b)(2). This results in a final critical habitat designation of 630 miles for spikedace and 610 miles for loach minnow, across 42 subunits. The specific areas excluded by the Service in the Final Rule are presented in Exhibit 1.

¹ 77 FR 10810.

² 75 FR 66482.

EXHIBIT 1. SUMMARY OF AREAS EXCLUDED FROM CRITICAL HABITAT IN THE FINAL RULE

UNIT	SUBUNIT	SPECIFIC AREAS EXCLUDED	ACTIVITIES OCCURRING WITHIN EXCLUDED LANDS	NUMBER OF RIVER MILES IN SUBUNIT	NUMBER OF RIVER MILES EXCLUDED	PERCENTAGE OF SUBUNIT EXCLUDED
1	Verde River	0.8 miles Verde River on Yavapai-Apache Nation lands.	Tribally managed activities, including development, transportation, species management, and grazing.	106.7	0.8	1%
1	Beaver/Wet Beaver Creek	0.1 miles of Beaver and Wet Beaver Creeks on Yavapai-Apache Nation lands.	Tribally managed activities, including development, transportation, species management, and grazing.	20.8	0.2	1%
2	White River	18.0 miles of Mainstem White River.	Tribal.	18	18	100%
2	East Fork White River	10.7 miles of East Fork White River.	Tribal.	10.7	10.7	100%
3	San Pedro River	37.2 miles of San Pedro River.	Fire management, transportation, and grazing.	37.2	37.2	100%
5	Eagle Creek	17.1 miles of Eagle Creek on the San Carlos Apache Reservation.	Tribal.	46.9	17.1	36%
5	Eagle Creek	Approximately 13.3 miles of Eagle Creek owned by Freeport McMoran (FMC) or its subsidiaries.	Fire management and grazing.	46.9	13.3	28%
6	San Francisco River	8.8 miles of the San Francisco River owned by FMC or its subsidiaries.	Transportation and grazing.	112.3	8.8	8%
8	Gila River	7.2 miles of the Gila River owned by FMC or its subsidiaries.	Transportation, species management, and grazing.	102.6	7.2	7%
8	Bear Creek	1.2 miles of Bear Creek owned by FMC or its subsidiaries.	Grazing.	19.5	1.2	6%
8	Manga Creek	4.9 miles of Mangas Creek owned by FMC or its subsidiaries.	Grazing.	5.7	4.9	86%
Source: Final Rule to Designate Spikedace and Loach Minnow Critical Habitat. February 23, 2012. 77 FR 10810.						

The FEA estimates the present value of post-designation incremental impacts associated with conservation efforts for the spikedace and loach minnow Proposed Rule to be \$2.95 million to \$6.7 million over twenty years (\$261,000 to \$592,000 on an annualized basis) using a real rate of seven percent, in addition to potential unquantified impacts to mining operations, tribal activities, Natural Resources Conservation Service (NRCS) funding, and water use associated with the City of Prescott, New Mexico Interstate Stream Commission (NMISC) proposed CAP projects, and Fort Huachuca military operations. Taking into account exclusions made by the Service under Section 4(b)2 of the Act in the Final Rule, this Final Memorandum estimates the present value of post-designation incremental impacts to be \$1.6 million to \$4.2 million over twenty years (\$143,000 to \$366,000 on an annualized basis) using a real rate of seven percent.

The post-designation incremental and baseline impacts reported in Exhibits 2 and 3, respectively, represent a reduction of the costs reported in the FEA in proportion to the percentage of lands excluded within each subunit. The percentage of lands excluded within each subunit is presented in Exhibit 1. Additionally, for subunits in which tribal activities were anticipated in the FEA, all impacts to tribal activities were eliminated, as no tribal lands were designated in the Final Rule. Then, the analysis applied the original reduction to impacts on other activities occurring within these subunits, based on the proportion of the river miles excluded in the Final Rule within each subunit.

Because tribally owned lands have been excluded, impacts related to critical habitat designation are not anticipated on those lands. However, because the San Carlos Apache Tribe holds water rights on Bonita Creek, a potential still exists for impacts to tribal water use, recreation, and traditional tribal activities on Bonita Creek and Eagle Creek. Also, although lands owned by FMC have been excluded on Eagle Creek, it is uncertain whether FMC water management practices on Eagle Creek could still be affected by the Final critical habitat designation. Natural Resources Conservation Service (NRCS) funding and water use associated with the City of Prescott and New Mexico Interstate Stream Commission (NMISC) proposed CAP projects are not affected by the Service's exclusions in the Final Rule and have the potential to be affected by the Final critical habitat designation. A summary of post-designation incremental and baseline impacts by subunit are presented in Exhibits 2 and 3, respectively.

EXHIBIT 2. SUMMARY OF POST-DESIGNATION INCREMENTAL IMPACTS (SEVEN PERCENT DISCOUNT RATE)

UNIT	REACH	PRESENT VALUE		ANNUALIZED COSTS		POTENTIAL UNQUANTIFIED IMPACTS
		LOW	HIGH	LOW	HIGH	
1	Verde River	\$34,200	\$37,000	\$3,010	\$3,260	City of Prescott water supply; NRCS Funding. ¹
	Granite Creek	\$61,600	\$61,600	\$5,430	\$5,430	
	Oak Creek	\$1,090	\$608,000	\$96	\$53,700	
	Beaver and Wet Beaver Creek	\$1,090	\$230,000	\$96	\$20,300	
	West Clear Creek	\$25,900	\$188,000	\$2,290	\$16,600	
	Fossil Creek	\$606	\$606	\$54	\$54	
2	Tonto Creek	\$32,100	\$277,000	\$2,830	\$24,500	NRCS funding.
	Greenback Creek	\$3,640	\$3,640	\$321	\$321	
	Rye Creek	\$689	\$689	\$61	\$61	
	Spring Creek	\$35,300	\$35,300	\$3,120	\$3,120	
	Rock Creek	\$15,600	\$15,600	\$1,380	\$1,380	
	White River	\$0	\$0	\$0	\$0	
	East Fork White River	\$0	\$0	\$0	\$0	
	North Fork East Fork Black River	\$3,410	\$3,410	\$301	\$301	
	East Fork Black River	\$5,710	\$5,710	\$504	\$504	
	Boneyard Creek	\$562	\$562	\$50	\$50	
	Coyote Creek	\$274	\$274	\$24	\$24	
3	San Pedro River	\$0	\$0	\$0	\$0	-
	Hot Springs Canyon	\$6,980	\$6,980	\$616	\$616	
	Bass Canyon	\$1,340	\$1,340	\$118	\$118	
	Redfield Canyon	\$14,100	\$14,100	\$1,240	\$1,240	
	Aravaipa Creek	\$12,600	\$12,600	\$1,110	\$1,110	
	Deer Creek	\$5,740	\$5,740	\$507	\$507	
	Turkey Creek	\$5,800	\$5,800	\$511	\$511	
4	Bonita Creek	\$12,400	\$12,400	\$1,090	\$1,090	San Carlos Apache water use, recreation, traditional activities
5	Eagle Creek	\$3,140	\$3,140	\$277	\$277	Mining activities.
6	San Francisco River	\$128,000	\$219,000	\$11,300	\$19,300	-
	Tularosa River	\$2,410	\$2,410	\$213	\$213	
	Negrito Creek	\$549	\$549	\$49	\$49	
	Whitewater Creek	\$0	\$0	\$0	\$0	

UNIT	REACH	PRESENT VALUE		ANNUALIZED COSTS		POTENTIAL UNQUANTIFIED IMPACTS
		LOW	HIGH	LOW	HIGH	
7	Blue River	\$23,900	\$23,900	\$2,110	\$2,110	-
	Campbell Blue Creek	\$998	\$998	\$88	\$88	
	Dry Blue Creek	\$383	\$383	\$34	\$34	
	Little Blue Creek	\$0	\$0	\$0	\$0	
	Pace Creek	\$100	\$100	\$9	\$9	
	Frieborn Creek	\$143	\$143	\$13	\$13	
8	Gila River	\$524,000	\$1,040,000	\$46,200	\$91,500	NMISC proposed CAP projects.
	West Fork Gila River	\$1,050	\$1,050	\$92	\$92	
	Middle Fork Gila River	\$1,540	\$1,540	\$136	\$136	
	East Fork Gila River	\$3,400	\$3,400	\$300	\$300	
	Mangas Creek	\$16,700	\$33,900	\$1,470	\$2,990	
	Bear Creek	\$2,380	\$2,380	\$210	\$210	
Total		\$989,000	\$2,857,000	\$87,300	\$252,000	N/A
Note: Totals may not sum due to rounding. 1. It is possible that some farmers may choose not to participate in NRCS programs after critical habitat is designated.						

EXHIBIT 3. SUMMARY OF POST-DESIGNATION BASELINE IMPACTS (SEVEN PERCENT DISCOUNT RATE)

UNIT	REACH	PRESENT VALUE		ANNUALIZED COSTS		POTENTIAL UNQUANTIFIED IMPACTS
		LOW	HIGH	LOW	HIGH	
1	Verde River	\$10,900,000	\$26,300,000	\$966,000	\$2,320,000	City of Prescott water supply; NRCS Funding. ¹
	Granite Creek	\$50,800	\$50,800	\$4,480	\$4,480	
	Oak Creek	\$0	\$0	\$0	\$0	
	Beaver and Wet Beaver Creek	\$0	\$0	\$0	\$0	
	West Clear Creek	\$0	\$0	\$0	\$0	
	Fossil Creek	\$102,000	\$160,000	\$9,000	\$14,100	
2	Tonto Creek	\$998,000	\$2,240,000	\$88,000	\$198,000	NRCS funding.
	Greenback Creek	\$37,900	\$154,000	\$3,350	\$13,600	
	Rye Creek	\$7,170	\$29,100	\$633	\$2,570	
	Spring Creek	\$917,000	\$1,910,000	\$80,900	\$168,000	
	Rock Creek	\$24,500	\$61,800	\$2,160	\$5,460	
	White River	\$0	\$0	\$0	\$0	
	East Fork White River	\$0	\$0	\$0	\$0	
	North Fork East Fork Black River	\$74,200	\$129,000	\$6,550	\$11,400	
	East Fork Black River	\$83,300	\$230,000	\$7,350	\$20,300	
	Boneyard Creek	\$19,000	\$36,900	\$1,680	\$3,250	
	Coyote Creek	\$8,070	\$30,200	\$712	\$2,670	
3	San Pedro River	\$0	\$0	\$0	\$0	-
	Hot Springs Canyon	\$48,000	\$48,000	\$4,240	\$4,240	
	Bass Canyon	\$0	\$0	\$0	\$0	
	Redfield Canyon	\$1,040,000	\$2,050,000	\$91,600	\$181,000	
	Aravaipa Creek	\$488,000	\$1,410,000	\$43,000	\$125,000	
	Deer Creek	\$26,500	\$54,700	\$2,330	\$4,830	
	Turkey Creek	\$28,300	\$61,600	\$2,490	\$5,430	
4	Bonita Creek	\$163,000	\$345,000	\$14,300	\$30,400	San Carlos Apache water use, recreation, traditional activities
5	Eagle Creek	\$32,300	\$92,700	\$2,850	\$8,170	Mining activities.
6	San Francisco River	\$675,000	\$1,530,000	\$59,600	\$135,000	-
	Tularosa River	\$141,000	\$370,000	\$12,400	\$32,600	
	Negrito Creek	\$14,900	\$55,300	\$1,310	\$4,880	
	Whitewater Creek	\$0	\$0	\$0	\$0	

UNIT	REACH	PRESENT VALUE		ANNUALIZED COSTS		POTENTIAL UNQUANTIFIED IMPACTS
		LOW	HIGH	LOW	HIGH	
7	Blue River	\$6,910,000	\$6,980,000	\$609,000	\$616,000	-
	Campbell Blue Creek	\$33,000	\$111,000	\$2,910	\$9,810	
	Dry Blue Creek	\$13,100	\$49,600	\$1,160	\$4,380	
	Little Blue Creek	\$4,390	\$4,390	\$387	\$387	
	Pace Creek	\$3,440	\$13,000	\$303	\$1,150	
	Frieborn Creek	\$4,890	\$18,500	\$431	\$1,630	
8	Gila River	\$1,070,000	\$3,180,000	\$94,800	\$280,000	NMISC proposed CAP projects.
	West Fork Gila River	\$75,100	\$127,000	\$6,620	\$11,200	
	Middle Fork Gila River	\$72,800	\$102,000	\$6,420	\$8,970	
	East Fork Gila River	\$184,000	\$537,000	\$16,300	\$47,300	
	Mangas Creek	\$482	\$1,010	\$43	\$89	
	Bear Creek	\$81,400	\$308,000	\$7,180	\$27,200	
Total		\$24,376,000	\$48,822,000	\$2,150,000	\$4,307,000	N/A
Note: Totals may not sum due to rounding. 1. It is possible that some farmers may choose not to participate in NRCS programs after critical habitat is designated.						